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MEMBERSHIP AND SUBSCRIPTION
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Meeting date: third Thursday, 7:30 PM, Room 104, Casa Del Prado, Balboa Park, San Diego

E-mail: cmhertz@pacbell.net Website at: http://www.users.cts.com/crash/t/tarnold/SDSC/index.html

PROGRAM

Unnatural History: The Arrival, Establishment, and Integration of Exotic Species into California Marine Ecosystems

Jeffrey Crooks, Research Coordinator of the Tijuana River National Estuarine Research Reserve, is interested in estuarine ecology and invasion biology and will discuss introduced species in California waters.

Meeting date: 15 May 2003

CONTENTS

CLUB NEWS

The San Diego Shell Club Auction/Potluck

Forty-three members and guests attended the Club's annual auction/potluck. Beginning at 5:00 p.m. they perused the silent auction and voice auction tables as they visited with friends and enjoyed tasty appetizers. Dinner began at 6:00 p.m. with a feast of choices brought in for the potluck and promptly at 7:00 p.m. auctioneer Carole Hertz announced the start of the voice auction. The fun began!

The voice auction table overflowed with wonderful offerings – *Zoila eludens, Calliostoma titanium*, a pair of large shadow boxes with mounted specimen-quality abalone shells, old books (including a signed 1958 "Keen") and new books such as Wilson's *Australian Marine Shells*. The bidding was spirited, often very funny and always good natured. There wasn't a break until almost nine, when attendees got their second wind with dessert, coffee and soft drinks and crowded around the newly-opened dollar table – a piled up table of $1 goodies. The auction resumed, finishing up at just about 10:00 p.m. Many stayed and helped with the cleanup – including (thanks to Jim Goldammer) vacuuming the rooms.

The Club is grateful to those who donated material without which there would have been no auction: Twila Bratcher-Critchlow, Henry Chaney, Phil Clover, Judy Garfield, Billee Gerrodette, Jules & Carole Hertz, John Jackson, Anne Joffe, Kirstie Kaiser, Paul Kanner, George Kennedy, John La Grange, Marge & Ken Lindahl, David & Margaret Mulliner, Rosemary Pierce, Don & Jeanne Pisor, Chuck Reitz, Bill & Nancy Schneider and Carol Skoglund. And thanks also to the hard-working members who prepared the material for auction (Linda and Kim Hutsell and the Club board), made the punch and brought the soft drinks (Dave Mulliner and Bill Romer) and last but by no means least, a great debt of gratitude to Wes Farmer, who has hosted this marvelous auction/potluck at his condo's community room for many years now.

The Club's Calendar

The Club now has its social events scheduled and the dates and locations for our future parties have been set. Further details will be announced as the dates near. But please mark you calendars and save the dates.

– The September party will be held in Linda and John LaGrange's garden on Saturday September 20th.
– The Club's Christmas Party date is Saturday December 13th beginning at 6:00 p.m. and will be held at the Butcher Shop in Kearny Mesa.

Additions to the Club Roster

Cadien, Donald B., 2425 E. 5th St., #10, Long Beach, CA 90814. Phone: 562-433-4116. E-mail: <dcadien@lacsd.org>

Liff-Grief, Phil, 2447 Kemper Ave., La Crescenta, CA 91214. Phone: 818-541-1232. E-mail: <pliffgrief@sbcglobal.net>

IN MEMORIAM

PATRICIA (PAT) BOYD

NOVEMBER 9, 1925 - FEBRUARY 28, 2003

FIFTEEN SPECIES OF EPITONIIDAE (MOLLUSCA) RECORDED AT EL SALVADOR (TROPICAL EASTERN PACIFIC)

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In March 2001, the second author was a participant in a 16-day Smithsonian Tropical Research Institute (STRI) Expedition aboard the R/V *Urracá* to El Salvador. The coastal waters were explored from Departamentos (States) Ahuachapán to La Unión and mollusks were obtained with SCUBA, trawling from the R/V *Urracá*, intertidal collecting and sampling aboard commercial shrimp trawlers. Found on this trip were 15 species of epitoniids, of which only three were known from El Salvador [*Epitonium mitraeforme* Sowerby, 1844, *Eptionium statuminatum* (Sowerby, 1844) and *Amaea ferminiana* (Dall, 1908)]; 12 are new records [denoted by an asterisk(*)], of which nine are identified. All the epitoniid species identified herein have been reported as occurring over a wide range in the Panamic Province (Keen, 1971; DuShane, 1974; Alamo & Valdivieso, 1987; Hernández C., 1992; Finet, 1994; Kaiser, 1997; and Weil et al., 1999).

In his most recent molluscan inventory of El Salvador, Hernández C. (1992) listed four epitoniid species: *Epitonium (Nitidiscala) aciculinum* (Hinds, 1844); *E. (Asperiscala) canna* (Dall, 1919); *E. (Asperiscala) indistinctum* (Sowerby, 1844) and *Amaea (Scalina) ferminiana* (Dall, 1908). His study focused primarily on coastal shallow waters (mangroves, cobbles, rocky and sandy beaches). Of the four species reported by Hernández, only *A. ferminiana* was found by the STRI Expedition, a goal of which was to sample the deeper waters. A variety of different species, complementing Hernández C. (1992) were found. Though *Epitonium statuminatum* found on the STRI Expedition was not previously recorded from El Salvador, the synonym *E. strongianum* Lowe, 1932b, was described from La Unión, El Salvador. Identifications of the species reported herein were confirmed by the first author after examining comparative material in the Santa Barbara Museum of Natural History (SBMNH) and the Carol Skoglund Collection.

The species are arranged in alphabetical order within genera. Following Bouchet and Warén (1986) and McLean (1996), we are not using subgeneric assignments. The subgenera selected by DuShane (1974) and Weil et al. (1999) are listed in the discussion for each species. A comprehensive, annotated list of the El Salvador Mollusca collected on the STRI Expedition is in preparation by Kaiser and Skoglund. During this ongoing study, the epitoniids are housed in the Kaiser Collection.

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**Epitonium acapulcanum* Dall, 1917
(Figure 1)

Seven empty adult shells from 7.0 to 10.3 mm and one juvenile 1.1 mm specimen were collected on 12 March 2001 intertidally in the estero (estuary) north of Isla Perico, Bahía de La Unión, Golfo de Fonseca [13°22.80'N, 87°52.30'W] in shell and barnacle rubble over fine mud in an area of mangroves and tide pools. The illustrated specimen, which has seven post-nuclear whorls, is a size record for this species.

Keen (1971) listed the distribution as Bahía Magdalena, Baja California, throughout the Golfo de California, México, and south to the Islas Galápagos, Ecuador. Shasky (1984) extended the distribution to Manabí Province, Ecuador, and Shasky (1996) included Isla del Coco, Costa Rica. DuShane (1974) placed this species in the subgenus *Asperiscala* de Boury, 1909, based on the spiral sculpture of light striations to heavy cords, "sometimes obsolete on later whorls" and usually having recurved costae sometimes with a spine at the shoulder. Weil et al. (1999) considered the species to be in the subgenus *Sodaliscala* de Boury, 1909, a subgenus which "resembles *Parviscala"* de Boury, 1887, but does not have peaked costae.

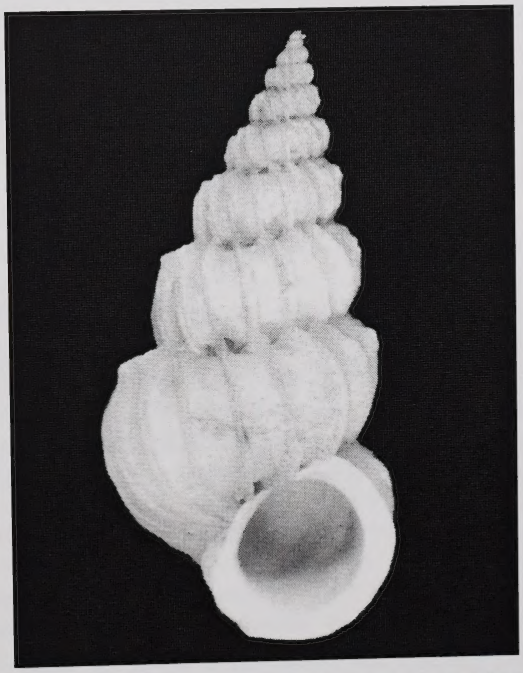

Figure 1. *Epitonium acapulcanum*, 10.3 mm. Photo: D.K. Mulliner.

**Epitonium emydonesus* Dall, 1917
(Figure 2)

The 2.5 mm live-taken specimen was collected on 8 March 2001 at Isla Meanguera, Golfo de Fonseca [13°09.603'N, 87°42.515'W] with SCUBA in 12 m from shakings (taking rock and dead coral and shaking the debris into a canvas bag) in an area of large, gorgonian covered boulders down to barnacle rubble. Kaiser and Bryce (2001: 149, pl. 22, fig. 1) illustrated a conspecific specimen at Isla de Malpelo, Colombia. DuShane (1974) and Weil et al. (1999) placed this species in the subgenus *Asperiscala*.

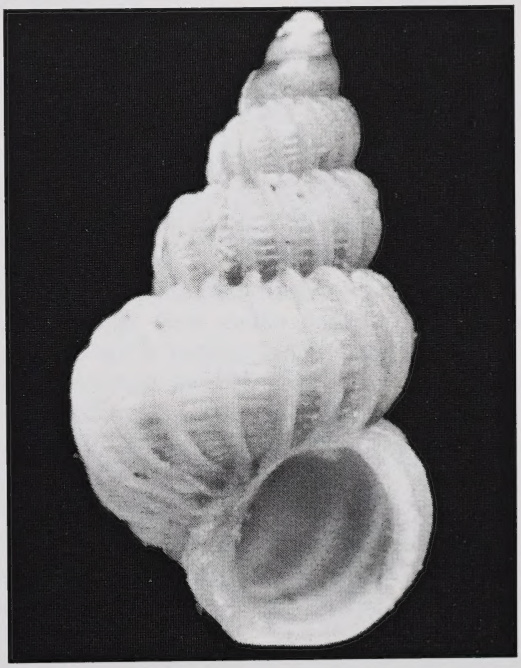

Figure 2. *Epitonium emydonesus*, 2.5 mm. Photo: D.K. Mulliner.

**Epitonium eutaenium* Dall, 1917
(Figure 3, [2 views])

The 8.1 mm partial shell was collected on 19 March 2001 off Departamento Usulután [12°57.95'N, 88°09.71'W], trawled in 47.5 to 53.0 m. Although the *E. eutaenium* specimen is in poor condition, the figures show the nine worn costae continuous over the very deep suture. The spiral lines noted for this species are not apparent on the figured specimen. However, worn specimens of this species in three lots from the DuShane Collection now in the Santa Barbara Museum of Natural History (SBMNH), compare with the figured specimen showing the continuous worn costae over the suture and

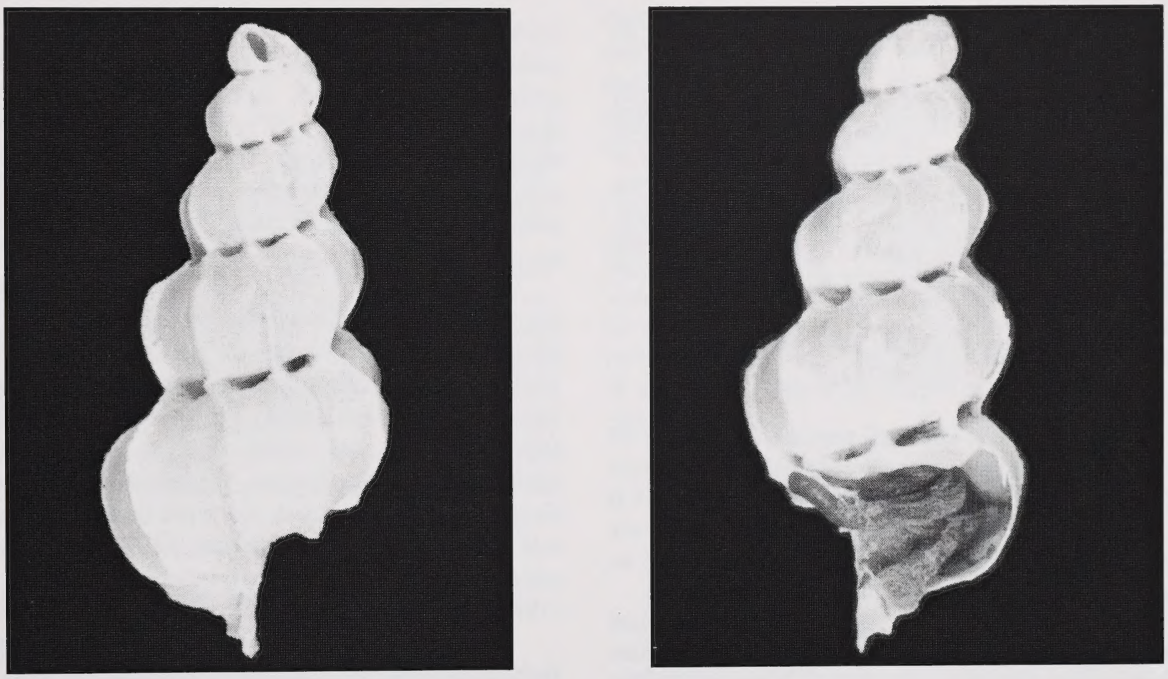

Figure 3. *Epitonium eutaenium,* 8.1 mm partial specimen, 2 views. Photos: D.K. Mulliner.

no spiral lines.

Epitonium eutaenium is recorded from the Golfo de California to the Islas Galápagos, Ecuador (Keen, 1971; DuShane, 1974; Weil et al., 1999). DuShane (1974) placed this species in the subgenus *Asperiscala* based on the spiral cords between the costae, but Weil et al. (1999) considered it in *Parviscala* and added the character of the closed umbilicus to that of the spiral cords.

Epitonium mitraeforme (Sowerby, 1844)
(Figure 4)

The 12.6 mm partial shell was trawled on 16 March 2001 off Departamento La Libertad [13°23.10'N, 89°31.70'W to 13°24.48'N, 89°31.07'W] in 45.0-51.5 m in mud. This partial shell has a deep suture with costae having strong vertical spines posteriorly and not expanded over the whorls. Weil et al.(1999) considered the species "extremely rare and known from a few specimens from the west coast of Mexico." DuShane (1974) said that since the time of the original description, "only one other specimen (in the Shasky collection, live-taken from the Gulf of Tehuantepec, Mexico ...) compares favorably with a photograph of the type." After comparing this fragment with the Shasky and DuShane specimens, now in the SBMNH,

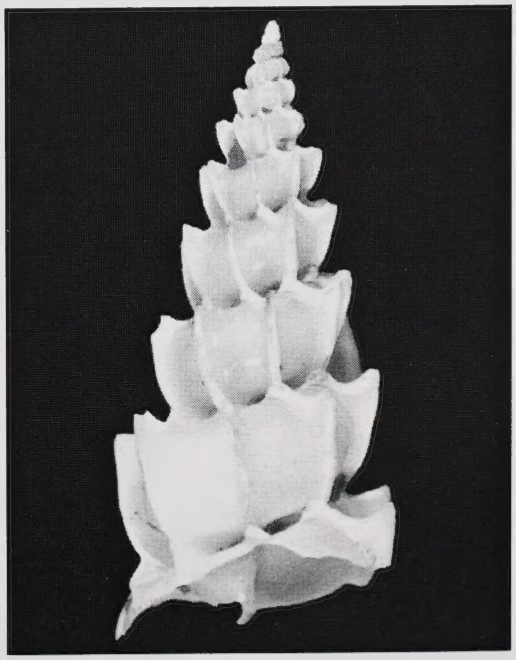

Figure 4. *Epitonium mitraeforme,* 12.6 mm, partial specimen. Photo: D.K. Mulliner.

we are convinced that the specimen figured here is *E. mitraeforme*.

The species was placed in *Hirtoscala* Monterosato, 1890, by DuShane (1974) based on the species having "costae with an exaggerated sometimes tubular spine at the periphery of the whorl." Weil et al. (1999) considered the species to be in *Lamelliscala* de Boury, 1909, for the additional features of a partially hidden umbilicus and sutures not widely open.

Epitonium obtusum (Sowerby, 1844)
(Figure 5a)

The 5.9 mm live-collected specimen was taken on 8 March 2001 at Isla Meanguera, Golfo de Fonseca [13°10.032'N, 87°42.946'W], with SCUBA in 5.0-7.0 m from rock and dead coral shakings in an area of rock face down to boulders. It has faint spiral sculpture on the early whorls which does not show in Figure 5a.

An 8.4 mm shell was also collected at the same time and place which closely resembles *Epitonium suprastriatum* (Carpenter, 1859) (Figure 5b). This species was synonymized with *obtusum* by Keen (1971) but DuShane (1974) and Weil et al. (1999) considered it a separate species "based primarily on the lack of spiral sculpture on the early whorls in this species." Examination of DuShane and Shasky specimens in the SBMNH, revealed some specimens identified as *suprastriatum* with spiral cords on the early whorls and some identified as *obtusum* lacking spiral cords on the early teleoconch whorls. Keen (1971) stated "some specimens [*obtusum*] with spiral sculpture on early whorls." This specimen (Figure 5b) with spiral sculpture on the first two teleoconch whorls which show only under high magnification, has a deep suture and also has costae which rise to spines at the suture.

It seems to us that the distinctions between *suprastriatum* and *obtusum* are still not resolved. The illustration of *suprastriatum* in Weil et al. (1999, fig. 470) differs considerably from that of the syntype figured in DuShane (1974, fig. 78). Perhaps, Keen (1971) was on the right track in synonymizing *suprastriatum* with *obtusum*. We provisionally follow Keen here until anatomical work can be done on these two nominate species. DuShane (1974) considered *obtusum* in the subgenus *Asperiscala* whereas Weil et al. (1999) placed it in *Parviscala*.

The species' distribution [as *obtusum*] is southern Baja California and Mazatlán, Sinaloa, México, to Ecuador (Keen, 1971); Golfo de California to Colombia (DuShane, 1974); Perú (Shasky, 1996) and Golfo de California to Perú (Weil et al., 1999). As *E. suprastriatum* the range is listed as La Paz, Baja California Sur to Mazatlán, Sinaloa, México (DuShane, 1974) and Perú (Shasky, 1996).

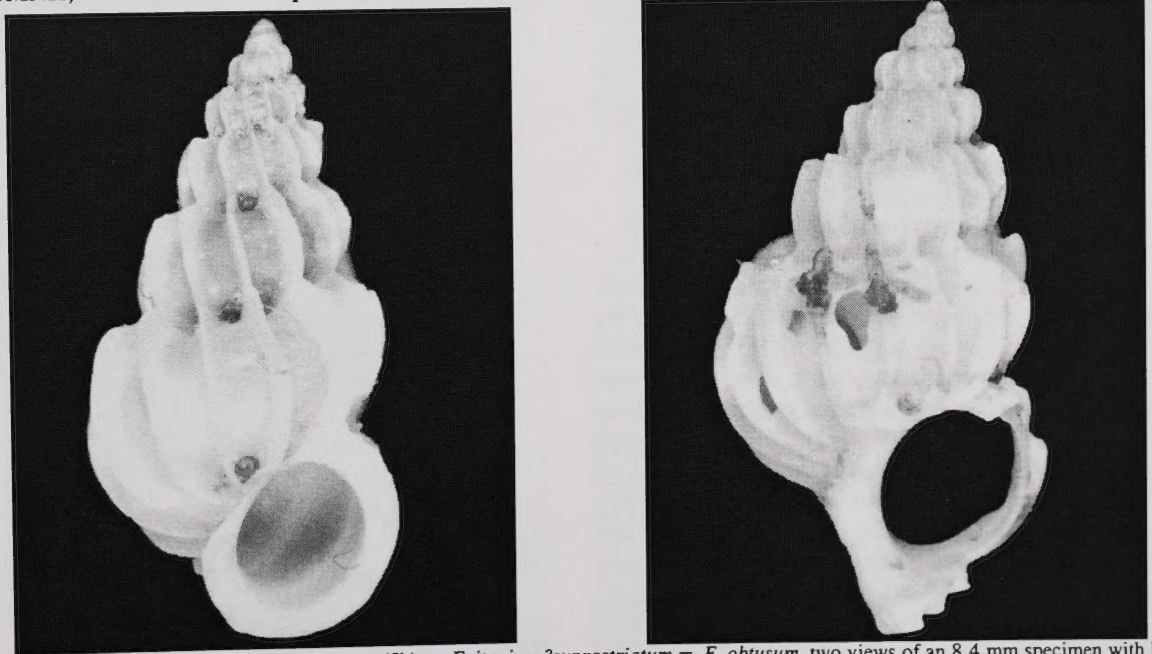

Figure 5a,b. (5a) *Epitonium obtusum*, 5.9 mm. (5b). *Epitonium ?suprastriatum* = *E. obtusum*, two views of an 8.4 mm specimen with broken aperture. Photos: D.K. Mulliner.

**Epitonium politum* (Sowerby, 1844)
(Figure 6)

The 10.7 mm shell was collected empty on 15 March 2001. It was trawled at night off Departamento Ahuachapán [13°15.71'N, 90°02.20'W to 13°15.56'N, 90°01.09'W] from the R/V *Urracá* in 121 to 125 m in mud with galatheid shrimps.

The species has been reported from San Pedro, southern California, to Ecuador and the Islas Galápagos (Keen, 1971; DuShane, 1974). The species was placed in *Nitidiscala* de Boury, 1909, by Dushane (1974) because the species lacks spiral sculpture. Weil et al. (1999) considered the species to be in the subgenus *Hyaloscala* de Boury, 1889, which species have thin costae, closed sutures and umbilicus, and lack spiral sculpture.

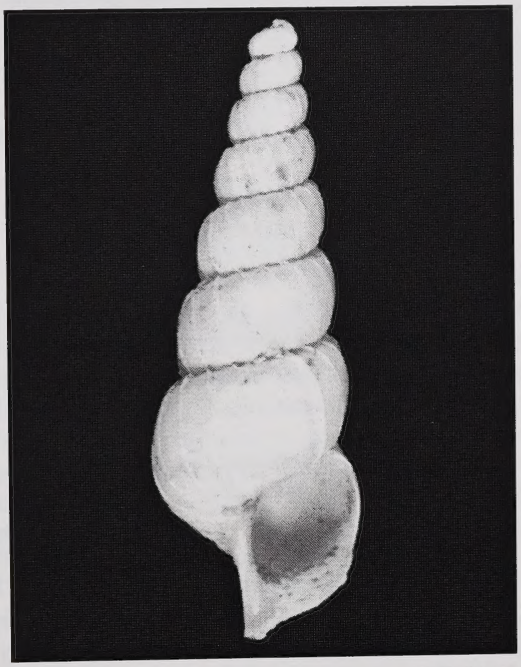

Figure 6. *Epitonium politum*, 10.7 mm. Photo: D.K. Mulliner.

**Epitonium replicatum* (Sowerby, 1844)
(Figure 7)

The 9.8 mm shell was collected empty on 19 March 2001 off Departamento Usulután [12°57.95'N, 88°09.71'W], trawled in 47.5 to 53.0 m.

This specimen was compared with Dushane material in the SBMNH because it has ten costae on the whorl rather than the seven to eight in the description of the species. The museum specimens studied all have more than seven to eight costae, most having ten, as does the specimen figured here. However, the angle of the photograph gives the specimen a more tabulate appearance than it actually has.

Keen (1971) lists the species from the Golfo de California to the Islas Galápagos and Weil et al. (1999) extended the range "from the Panamic Province west to Japan and Australia ... intertidally and in offshore waters." Keen (1971) and DuShane (1974) considered the species to be in *Hirtoscala* because the species bears reflected costae with exaggerated spines at the periphery of the whorl. Weil et al. (1999) placed the species in *Epitonium s.s.*

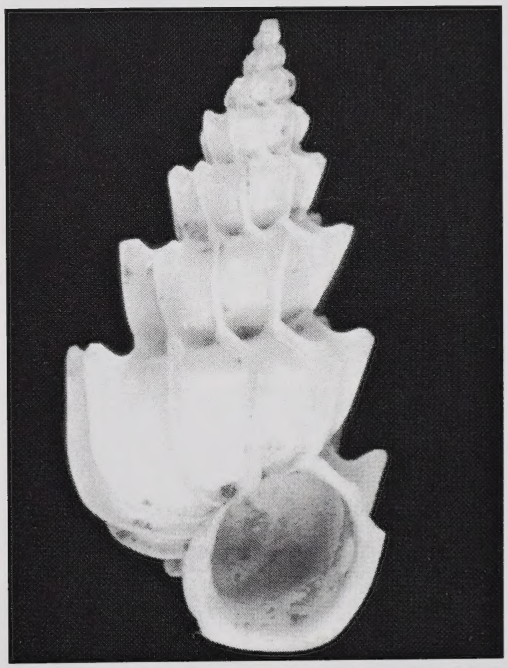

Figure 7. *Epitonium replicatum*, 9.8 mm Photo: D.K. Mulliner.

Epitonium statuminatum (Sowerby, 1844)
(Figure 8)

The distinctive 18.9 mm empty shell was collected in the intertidal zone (0.14 m) at Isla Martín Pérez, Golfo de Fonseca [13°16.705'N, 87°44.357'W] on 9 March 2001.

Previous distribution information by Keen (1971) and DuShane (1974) [as *Epitonium (Nitidiscala) statuminatum*] lists Mazatlán, Sinaloa, México, to Perú; Alamo and Valdivieso (1987) include Guayaquil, Ecuador, in the range. However, *Epitonium strongi*

Lowe, 1932a (later amended to *strongianum* Lowe, 1932b), listed as a synonym of *E. statuminatum* (Keen, 1971; DuShane, 1974; Weil et al., 1999) was described from La Unión, Golfo de Fonseca, El Salvador.

As noted, DuShane (1974) placed the species in the subgenus *Nitidiscala* as did Keen (1971) based on the broad, costae, "obliquely continuous from whorl to whorl." Weil et al. (1999) placed it in *Gyroscala* de Boury, 1887, which they elevated to a genus based on its basal ridge, closed umbilicus and erect costae.

Figure 8. *Epitonium statuminatum,* 18.9 mm. Photo: D.K. Mulliner.

Epitonium tinctorium Dall, 1919
(Figure 9)

The 7.7 mm empty shell was collected on 9 March 2001, at Isla Martín Pérez, Golfo de Fonseca [13°16.705'N, 87°44.357'W], from rock and dead coral shakings in the intertidal zone of a sand beach flanked with a large rocky area.

Keen (1971) gave the distribution from the Golfo de California to Panamá. DuShane (1974) added the outer coast of Baja California at Bahía Magdalena to the distribution. Weil et al. (1999) mentioned that the species can be confused with *E. (Sodaliscala) zeteki* Dall, 1917. However, this specimen has a 3-whorled protoconch and a brown band in front of the suture not found in *zeteki*. The species was placed in *Asperiscala* by DuShane (1974) based on the fine, irregularly spaced spiral striations between the costae. Weil et al. (1999) considered the subgenus to be *Labeoscala* de Boury, 1912, which closely resembles *Sodaliscala* but differs in having a strongly thickened outer lip.

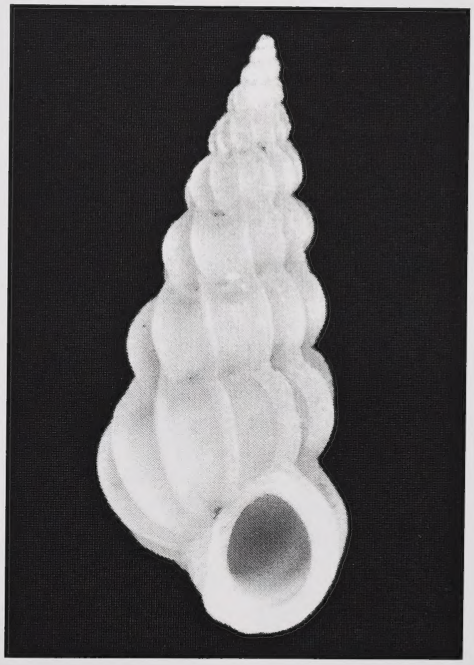

Figure 9. *Epitonium tinctorium*, 7.7 mm. Photo: D.K. Mulliner.

Epitonium turbinum (Dall, 1908)
(Figure 10)

The 26.8 mm decollate shell collected on 19 March 2001was taken off Departamento Usulután [12°36.58'N, 88°26.56'W to 12°39.80'N, 88°24.26'W], by trawling in 132-155 m in mud with galatheid shrimps. Only a single, crabbed shell was found.

Described from Isla Hood, Islas Galápagos, Ecuador, the known distribution of this species is Isla San Pedro Nolasco, Golfo de California, México, to the Galápagos (Keen, 1971; Weil et al., 1999). The subgeneric placement in *Sthenorytis* Conrad, 1862, by DuShane (1974) is based on a heavy shell with a large body whorl, thick, blade-like costae, rapidly expanding whorls and presence of a basal disk. Weil et al. (1999) considered *Sthenorytis* a genus.

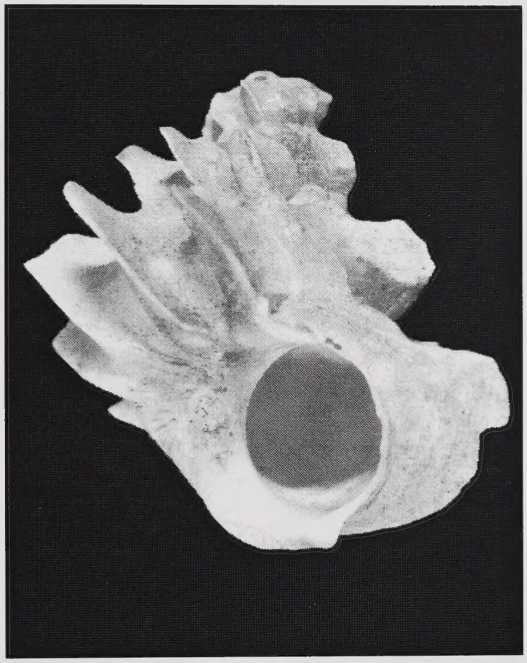

Figure 10. *Epitionium turbinum,* 26.8 mm. Photo: D.K. Mulliner.

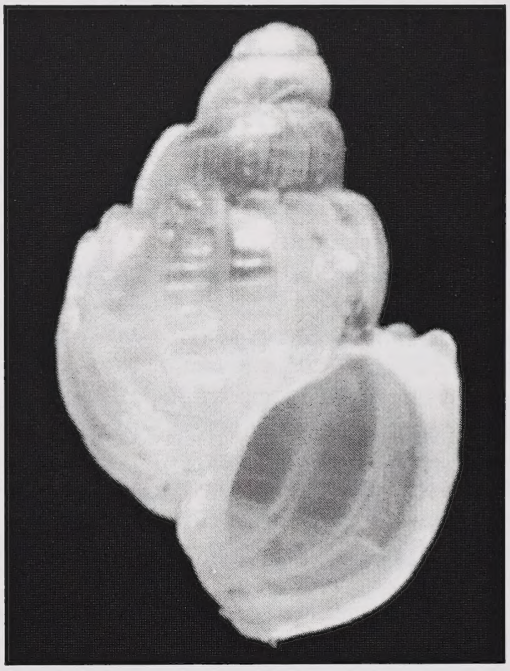

Figure 11. *Epitonium* sp. 1, 1.1 mm. Photo: D.K. Mulliner.

***_Epitonium_ sp. 1**
(Figure 11)

The 1.1 mm 3-whorled, glassy shell was collected empty on 7 March 2001 at Isla Meanguera, Golfo de Fonseca [13°10.121'N, 87°43.376'W] with SCUBA in 4.0 m from rock and dead coral shakings in an area of sloping scree down to silty mud. Spiral sculpture on the teleoconch, approximately 15 costae rising to a spine on the body whorl and an oval, reflected aperture can be seen in Figure 11. Based on the spiral sculpture this specimen is probably in the subgenus *Asperiscala.*

***_Epitonium_ sp. 2**
(Figure 12)

The 2.1 mm shell with broken aperture was collected on 8 March 2001 at Isla Meanguera, Golfo de Fonseca [13°09.603'N, 87°42.515'W] with SCUBA in 12.0 m from rock and dead coral shakings in an area with large gorgonian covered boulders sloping down to barnacle rubble. As can be seen in the illustration, the specimen with 3^+ whorls has a very deep suture with axial costae which continue across the suture onto the next whorl. No spiral sculpture was seen on this somewhat worn shell.

Figure 12. *Epitonium* sp. 2, 2.1 mm. Photo: D.K. Mulliner.

Amaea brunneopicta (Dall, 1908)
(Figure 13)

The 37.1 mm decollate shell from Departamento Ahuachapán, El Salvador [13°33.40'N, 90°03.33'W to 13°32.88'N, 90°02.35'W] was trawled in 52.5 m in mud. A second empty 28.0 mm shell with protoconch was trawled on 21 March 2001 off Departamento Sonsonate at 40 m in mud.

Keen (1971) lists the distribution as Isla Cedros, Baja California, and the Golfo de California, México, south to the Islas Galápagos, Ecuador. DuShane (1974) considered Costa Rica the southernmost point of the range and Finet (1985) included the Galápagos in the distribution but then reversed his previous conclusion in 1994. This species is placed in the subgenus *Scalina* Conrad, 1865, which is characterized by a basal ridge below which the sculpture differs from the rest of the teleoconch (Keen, 1971; DuShane, 1974; Weil et al., 1999).

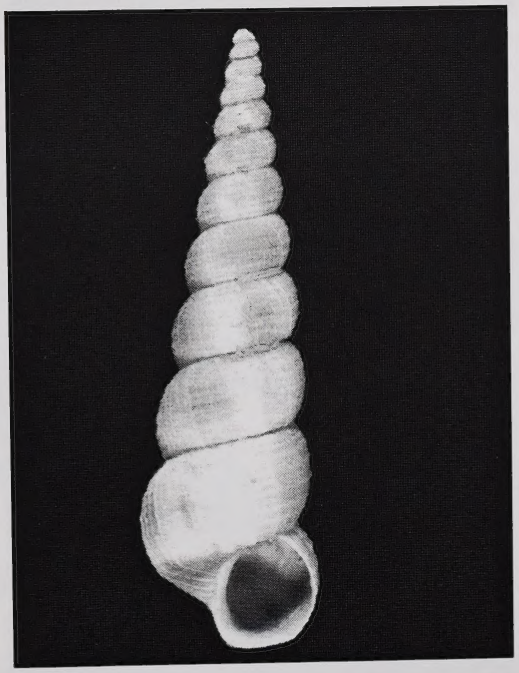

Figure 13. *Amaea brunneopicta*, 37.1 mm. Photo: D.K. Mulliner.

Amaea ferminiana (Dall, 1908)
(Figure 14)

The 44.5 mm specimen was trawled from the R/V *Urracá* on 15 March 2001 off Departamento Ahuachapán [13°33.40'N, 90°03.33'W to 13°32.88'N, 90°02.35'W] in 52.5 m in mud. A second 33.3 mm specimen was trawled on 21 March 2001 off Departamento Sonsonate at 30 m in mud.

Keen (1971) lists the distribution from the Golfo de California to Colombia. Alamo and Valdivieso (1987) and Weil et al. (1991) included Perú in the range. Hernández C. (1992) first reported the species from El Salvador. The species is larger and broader than *A. brunneopicta*. It has been placed in the subgenus *Scalina* (Keen, 1971; DuShane, 1974; Weil et al., 1999).

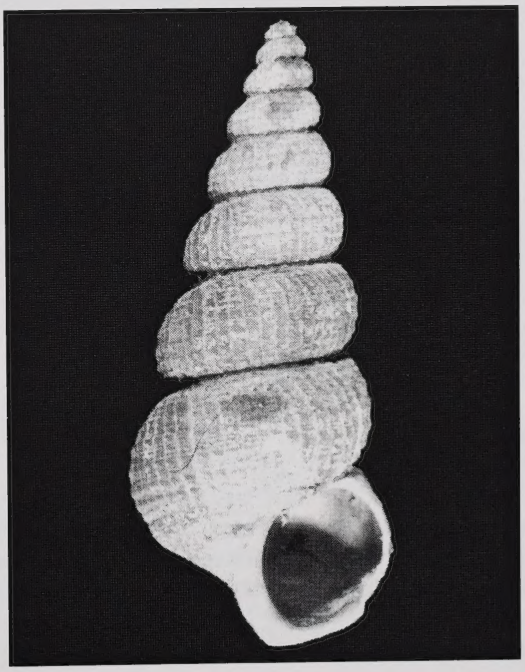

Figure 14. *Amaea ferminiana*, 44.5 mm. Photo: D.K. Mulliner.

***?Opalia* sp. 1**
(Figure 15)

The 3.1 mm crabbed specimen was collected on 8 March 2001 at Isla Meanguera, Golfo de Fonseca [13°10.032'N, 87°42.946'W] with SCUBA in 5.0-7.0 m by shakings in an area of rock face down to boulders. The specimen has a smooth, 3^{+}whorled, tilted protoconch with a brown tip; the teleoconch surface covered with intritacalx bears numerous, evenly-spaced spiral cords with microscopic pitting between, the spiral cords extending over the 14 axial ribs.

Figure 15. ?*Opalia* sp. 1, 3.1 mm. Photo: D.K. Mulliner.

ACKNOWLEDGMENTS

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BOOK NEWS

New Worldwide Cowries
By: Felix Lorenz (2002)
Publisher: ConchBooks, Hackenhein, Germany.
292 pp., 41 color plates, 38 text figures., 37 maps.
Price: $60 US

There is something for everybody in this book. If you are cowrie lumper, here is an entire book where you can disagree with almost everything. If you are a hard-core cowrie splitter then there are 37-39 new taxa, depending on how you count. If you are a serious student of the Cypraeidae there are some well thought-out studies of several species complexes that will make you think. The book covers the entire family, but is limited only to significant revisions of existing taxa (the *mappa* complex), erection of new taxa, and a combination of the these two taxonomic actions. Readers expecting to find descriptions and color illustrations of the taxa described since the release of Lorenz & Hubert second ed. (Lorenz & Hubert, 2000), but before this book will be disappointed. However, there is a partially illustrated checklist that may satisfy some of the desire for an update.

Zoila fanciers will be pleased to find four new subspecies of this fascinating genus. One of the new subspecies *Z. decipiens suprasinum* is described as being intermediate between *decipiens* and *eludens*. The new taxa are sure to delight *Zoila* fanciers and very likely to raise significant controversy among the more conservative students of the genus.

Three new subspecies of *Mauritia maculifera* and *M. scurra* are described. These are described in the context of a careful discussion of the distribution and range of these two species. Time will tell whether these new taxa stand.

The *Leporicypraea mappa* complex is given an insightful treatment based on Meyer's recent molecular work (Meyer, in press) and conchological observations. The result is that *L. mappa* is split into two species with *L. geographica* being raised to species rank. In this reviewer's opinion this action largely resolves many of the quandaries posed by the *mappa* complex. The discussion also includes descriptions of two new subspecies of *L. mappa*.

A new subspecies of *Lyncina porteri* is described from the central Pacific. This rather distinctive new taxa looks rather interesting and should withstand the test of time.

The genus *Luria* is treated by validation of *L. cinerea brasilensis* and the description of *L. gilvella*. *Luria cinerea brasilensis*, although not previously described in a valid manner, has been accepted for some time. The author observes that full speciation either has already occurred or is in process. The new species *L. gilvella* provides resolution of some widely distributed and rather problematic specimens. The associated discussion of the *L. isabella* complex adds some clarity to this thoroughly lumped group. Some old controversies are sure to be revived.

The South African genus *Cypraeovula* is treated with the description of five new subspecies, one new species, and the revival of one previously synonymized species as a subspecies (*C. fuscorubra gondwanalandensis*). This genus rivals the Australian *Zoila* in terms of regional and possibly environmental variation. The discussion of *Cypraeovula* is well thought out and will be of interest to students of this difficult genus.

The rare genus *Nesiocypraea* benefits from the description of two new species and three new subspecies. Both of the new species are the result of recent dredging activities and represent taxa either entirely new to science or known only from one undescribed specimen. The discussion of the new subspecies adds useful information on the species *N. teramachii* and *langfordi*. The hypothesis is presented that *langfordi* may justify its own genus (*Austrasiatica*) on conchological and molecular grounds. This hypothesis could have some interesting phylogenetic implications.

The genus *Erronea* is treated by the description of two new subspecies. The new subspecies of *E. caurica* is accompanied by an extensive discussion of the distribution of the previously described subspecies. This is the most complete discussion of this complex that this reviewer has seen in the literature and is well worth

reading.

The genera *Purpuradusta* and *Bistolida* each have one new subspecies described or validated. *Palmadusta* has one new species described. In all three cases these new or validated taxa are highly regional. The narrow conchological grounds for each place them on what may be shaky ground.

The *Blasicrura teres* complex is given extensive treatment. One previously known form is validated (*B. pellucens panamensis*) albeit in a different species than previous usage and two new subspecies are described. The argument is made that two well accepted species are actually synonyms [*burgessi* (Kay, 1981) = *latior* (Melvill, 1888) and *alisonae* (Burgess, 1983) = *pellucens* (Melvill, 1888)]. The taxonomic history of the entire *teres* complex is carefully presented to support the case. Even though much of the evidence is not new, the author's presentation is more even-handed than most previous presentations of the material. This chapter may well be the most controversial of the entire book and is certain to foster significant controversy.

The genus *Cribrarula* is treated with a cursory discussion of recently described species and subspecies in the genus and detailed discussions of the *esontropia* complex and the West Australian *cribraria-exmouthensis-fallax* complex. One new subspecies of *esontropia* is described and the species *cribellum* is demoted to a subspecies of *esontropia*. These actions clarify a somewhat muddy taxonomy in the *esontropia* complex. The extensive discussion of the West Australian *cribraria-exmouthensis-fallax* complex introduces or validates four subspecies. This discussion provides clarity to a group that has been treated previously in a somewhat ad hoc manner. The author's treatment is well documented and makes its case well.

The genus *Notadusta* has one new species and one new subspecies described. These additions appear to clarify this rare genus. Last, but not least, a new subspecies of *Erosaria citrina* is described. This new subspecies from Madagascar resolves the previously observed differences between the African and Madagascar populations of this species.

The book closes with an illustrated checklist of the species and subspecies of the living Cypraeidae. For all of its many strengths the book is not without flaws. One "flaw" that some readers may note is its validation of numerous "names" originally introduced by Raybaudi. A careful reading reveals that far more Raybaudi "names" are rejected than are validated and those that are validated have a solid basis. This reviewer can point out two apparent flaws. The first is that many of the newly described subspecies have extremely limited ranges and are based on fine conchological distinctions. The second flaw is that synonymies do not take the form accepted in the malacological literature and the more advanced collector-oriented books. The material for the synonymies is present, it is just presented in a form that detracts from the otherwise high level of scholarship.

The book is recommended to students of the Cypraeidae seeking descriptions of new taxa and an update on the Lorenz point of view on some significant topics. The book is not recommended for the casual collector of cowries since they are unlikely to encounter many of the taxa described and they may find the fine distinctions bewildering.

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